HEARING SCREENING PROTOCOL COMPARISON
FOR PRESCHOOLERS, TODDLERS, AND INFANTS

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Introduction

• What are hearing screenings?
• Why are they important?
• What are hearing screening tools?
Introduction

- Purpose of hearing screenings:
  - Identify individuals who are likely to have a hearing loss
  - Refer to an audiologist for further diagnostic testing
Introduction

• Hearing screening importance:
  • Early identification and intervention
  • Auditory, speech, language, and socio-emotional development

(Eiserman, Shisler, Foust, Buhrmann, Winston, & White, 2008)
Introduction

- Unmanaged hearing loss:
  - Causes deficits in key developmental processes
  - Speech and/or language disorders, feelings of isolation, academic difficulties

(Busacco, 2010)
Early Hearing Detection and Intervention (EHDI) Programs

- Established in every state/territory in US
- Newborn hearing screenings
  - Identify hearing loss at birth

What about progressive and acquired hearing loss?

(White, 2008)
Progressive and Acquired Hearing Loss

• 20% of childhood hearing loss
• Increases need for hearing screenings later in childhood

(Georgalas, Xenellis, Davilis, Tzangaroulakis, & Ferekidis, 2008)
Importance of hearing screening

• Identify children with hearing loss early to improve developmental outcomes
• Sensitivity and specificity
• Referral to audiologist

(Smiley, Shapley, Eckl, & Nicholson, 2012)
Hearing screening tools

- Transient evoked otoacoustic emissions (TEOAEs)
- Otoscopy
- Immittance testing
- Pure-tone screening
Purpose of this research

• Compare two hearing screening protocols
  • Protocol #1: TEOAEs
  • Protocol #2: TEOAEs, otoscopy, immittance testing, and pure-tone screening
Methods

• Secondary data analysis:
  • EHDI program
  • Hearing screening forms
Methods

• Participants
  • 709 infant, toddler, and preschool children
  • Albany County, Wyoming
Methods

• Procedures:
  • De-identified forms
  • Computerized using dual data entry procedure
  • Discrepancy resolution
Analysis

• SPSS 22 (2013)
  • Descriptive statistics and frequency data
  • 2 x 2 contingency table
  • Pearson chi-square
## Results

Figure 1. Crosstabulation of screening protocols

<table>
<thead>
<tr>
<th>Overall screening</th>
<th>TEOAE only</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Pass</td>
<td>Fail</td>
<td>Total</td>
</tr>
<tr>
<td>Pass</td>
<td>753</td>
<td>0</td>
<td>753</td>
</tr>
<tr>
<td>Fail</td>
<td>4</td>
<td>96</td>
<td>100</td>
</tr>
<tr>
<td>Total</td>
<td>757</td>
<td>96</td>
<td>853</td>
</tr>
</tbody>
</table>

- 88% passed both screening protocols
- 11% failed both screening protocols
- 0.4% passed TEOAE and failed screening battery
- 0% passed screening battery and failed TEOAE
Results

• Pearson Chi-square
  • $[\chi^2 (1, N=853) = 814.6; p=.0005)]$
• No statistically significant difference between the two hearing screening protocols
Discussion

• TEOAEs
  • Time-effective screening measure compared to complete screening battery
Discussion

• Influencing factors:
  • Background noise, middle ear pathology

• Limiting factors:
  • Analysis of written records
  • Geography and training of screeners
Discussion

• Future research
• Children who were unable to be screened
• Ages of children receiving TEOAEs versus pure-tones
• Examining rescreens and medical follow-ups
Conclusion

• Hearing screening protocols
  • crucial for identification and intervention of hearing loss in children

• TEOAEs may be an effective hearing screening protocol compared to complete screening battery

• More research is needed

(Eiserman et al., 2008)
References


